

Applied Mathematics Letters

an international journal of rapid publication

**List of Contents and Author Index
Volume 1, 1988**



PERGAMON PRESS
Oxford • New York • Beijing • Frankfurt
São Paulo • Sydney • Tokyo • Toronto

Applied Mathematics Letters

an international journal of rapid publication

Publishing Office

Journals Production Unit, Pergamon Press plc,
Hennock Road, Marsh Barton, Exeter, Devon
EX2 8NE, England [Tel. (0392) 51558; Telex
42749]

Advertising and Subscription Offices

North America: Pergamon Press Inc., Fairview
Park, Elmsford, NY 10523, U.S.A.
Rest of the World: Pergamon Press plc,
Headington Hill Hall, Oxford OX3 0BW, Eng-
land [Tel. (0865) 64881].

Annual Subscription Rates 1989

Published Quarterly

Annual institutional subscription rate, DM
280.00; 2-year institutional subscription rate,
DM 532.00 (including postage and insurance).
Personal subscription rate for those whose library
subscribes at the regular rate, DM 140.00. All
prices subject to amendment without notice.

Microform subscriptions and back issues

Back issues of all previously published volumes
are available direct from Pergamon Press. Back
issues of Pergamon journals in microform can
be obtained from: UMI, 300 North Zeeb Road,
Ann Arbor, MI 48106, U.S.A.

Copyright © 1988 **Pergamon Press plc**

It is a condition of publication that manuscripts
submitted to this journal have not been pub-
lished and will not be simultaneously submitted
or published elsewhere. By submitting a
manuscript the authors agree that the copyright
for their article is transferred to the publisher if

Managing Editor

Ervin Y. Rodin

Editorial Assistant

Patricia A. Busch

Department of Systems Science and Mathematics
Box 1040, Washington University
St Louis, MO 63130, U.S.A.

Tel.: 314-889-6007 or 889-5806

E-mail: uunet!wucs1!rodin!rodin
rodin@rodin.wustl.bitnet

and when the article is accepted for publication.
However, assignment of copyright is not re-
quired from authors who work for organizations
which do not permit such assignment. The
copyright covers the exclusive rights to repro-
duce and distribute the article, including
reprints, photographic reproductions, microform
or any other reproductions of similar nature and
translations. No part of this publication may
be reproduced, stored in a retrieval system or
transmitted in any form or by any means, elec-
tronic, electrostatic, magnetic tape, mechanical,
photocopying, recording or otherwise, without
permission in writing from the copyright holder.

PHOTOCOPYING INFORMATION FOR USERS IN THE USA

The Item-fee Code for this publication indicates
that authorization to photocopy items for inter-
nal or personal use is granted by the copyright
holder for libraries and other users registered
with the Copyright Clearance Center (CCC)
Transactional Reporting Service provided the
stated fee for copying beyond that permitted by
Section 107 or 108 of the US Copyright Law
is paid. The appropriate remittance of \$3.00 per
copy per article is paid directly to the Copyright
Clearance Center Inc., 27 Congress Street,
Salem, MA 01970.

Permission for other use. The copyright owner's
consent does not extend to copying for general
distribution, for promotion, for creating new
works, or for resale. Specific written permission
must be obtained from the publisher for such
copying.

*The Item-fee Code for this publication is:
0893-9659/88 \$3.00 + 0.00*

List of Contents

NUMBER 1

Ervin Y. Rodin 1 Editorial introduction

M. H. Ali Abadi and E. L. Ortiz 3 Numerical solution of feedback control systems equations

G. Adomian 7 Application of decomposition to convection-diffusion equations

V. Aladyev 11 A solution of the Steinhaus's combinatorial problem

H. T. Banks and K. Ito 13 A theoretical framework for convergence and continuous dependence of estimates in inverse problems for distributed parameter systems

A. Bayliss, B. J. Matkowsky and M. Minkoff 19 Adaptive pseudo-spectral computation of cellular flames stabilized by a point source

N. Cercone 25 Finding and applying perfect hash functions

T. F. Chen and G. J. Fix 29 Effects of grid irregularity on iterative methods

B. Codenotti 33 Fast parallel algorithms for matrix inversion and linear systems solution

J. R. Cox, Jr. 37 Can a crystal clock be started and stopped?

J. E. Dennis, Jr. and D. J. Woods 41 Curve tailoring with interactive computer graphics

N. Graham and F. Harary 45 The number of perfect matchings in a hypercube

P. P. N. de Groen 49 A singular perturbation problem with boundary and turning point resonance

J. Duvallet 53 An existence theorem for second order ordinary differential systems with nonlinear mixed boundary conditions

D. E. Knuth 57 Fibonacci Multiplication

Y. Lirov 61 K-th shortest collision-free path planning

S. Mitnik	65	Iterative versus noniterative derivation of moving average parameters of ARMA processes
W. C. Theinboldt	69	On a theorem of S. Smale about Newton's method for analytic mappings
E. Y. Rodin	73	Semantic control theory
T. L. Saaty	79	Speculating on the future of mathematics
B. A. Szabó	83	Solution of algebraic equations generated by the p-version of the finite element method
E. L. Wachspress	87	Iterative solution of the Lyapunov matrix equation
G. Walz	91	A note on the approximation of the incomplete gamma function by a method of G. Meinardus
L. A. Zadeh	95	Dispositional logic
Y. Zhang and R. P. Tewarson	101	A new quasi-Newton algorithm
	I	Instructions for authors
	III	Sample pages for authors

NUMBER 2

<i>Editorial</i>		
E. Y. Rodin	iii	The importance of being Robert Maxwell: an appraisal
R. Rosen	105	How universal is a universal unfolding?
C. G. E. Boender, A. H. G. Rinnooy Kan and A. H. Vellekoop	109	A random field model for estimating the content of soil layers
C. Jeffries	113	Traveling waves and shocks with pressure diffusion
M. Aslam Noor	119	General variational inequalities
Z.-C. Li	123	A note on Kellogg's eigenfunctions of a periodic Sturm-Liouville system
J. M. Harris and A. G. Ramm	127	Inversion of the acoustic well to well data
H. M. Srivastava and S. Owa	133	A characterization theorem for a certain class of analytic functions

F. B. Hanson and A.-M. Wazwaz	137 Singular and turning point resonance: small perturbations—big effects
T. F. Coleman and G. Li	141 Local convergence of the multi-secant method for the parallel solution of systems of nonlinear equations
L. Jódar	147 Existence, uniqueness and closed form solutions for boundary value matrix problems
R. U. Verma	151 Algebraic type of solutions for singular integral equations of the form $(S + T)x = x_0$ in Banach spaces
I. Gladwell, L. F. Shampine and R. W. Brankin	153 Locating special events when solving ODEs
Y. Lin and Y. Ma	157 A note on the models of general systems
D. Chhajed	161 A note on "Minimizing the maximum deviation of job completion time about a common due-date"
D. J. Evans	165 A stable nonlinear mid-point formula for solving ODEs
R. I. Greenberg and C. E. Leiserson	171 A compact layout for the three-dimensional tree of meshes
G. Behforooz	177 Quadratic spline
Y. Ma and Y. Lin	181 Limit properties of hierarchies of general systems
A. G. Ramm	185 A uniqueness theorem for an inverse problem
M. Sniedovich	189 A minimax job completion-time problem revisited
F. H. Clarke and P. D. Loewen	193 Intermediate existence and regularity in the calculus of variations
S. M. Kokoska	197 Including data from early deaths in the analysis of cancer chemoprevention experiments
I Instructions for authors	
III Sample pages for authors	

NUMBER 3

J. A. Adam	203 Integral invariants and complex eigenvalue bounds
V. Aladyev	207 An algebraical system for polynomial representation of k -valued logical functions

H. T. Banks, S. Reich and I. G. Rosen	211	Parameter estimation in nonlinear distributed systems-approximation theory and convergence results
G. Behforooz	217	Quadratic spline-on-spline
L. G. Chambers	219	Note on the stability of motion in a circle under a central force
D. J. Evans and B. B. Sanugi	221	Numerical solution of the Goursat problem by a nonlinear Trapezoidal formula
E. D. Huthnance and J. Warndof	225	On using primes for public key encryption systems
A. S. Jones	229	Eigenvalues and eigenfunctions for general Graetz problems
C. Knessl, B. J. Matkowsky, Z. Schuss and C. Tier	235	A state dependent $M/M/1$ queue: a production-inventory model
G. A. Kriegsmann and W. E. Olmstead	241	Source identification for the heat equation
B. D. Kulkarni	247	Exploiting the nature of numbers. An arithmetic-analytical approach to solutions of problems in basic and applied sciences
D. G. Lasseigne	251	Asymptotic analysis of a Volterra integral equation
B. N. Mandal and A. Chakrabarti	255	The plane vertical wavemaker problem—revisited
J. M. Martínez	259	A note on the implementation of the Accelerated Successive Orthogonal Projections Method for solving large scale linear feasibility problems
G. Melrose	263	The solution of a potential problem occurring in microwave transmission line theory
M. A. Noor and S. I. A. Tirmizi	267	Finite difference technique for solving obstacle problems
F. A. Odoom and R. S. Dahiya	273	Two dimensional bilateral operational relations
N. Papamichael and S. N. Stylianopoulos	277	On a domain decomposition method for the computation of conformal modules
C. Pugh and M. Shub	281	C' stability of periodic solutions and solution schemes
A. G. Ramm	287	A simple proof of the uniqueness theorem in impedance tomography

R. P. Tucci	291	A new proof of the Krohn–Rhodes theorem for transformation semigroups
T. C. E. Cheng	295	On a single-machine optimal constant due-date assignment and sequencing problem
T. Hagstrom, R. P. Tewarson and A. Jazcilevich	299	Numerical experiments on a domain decomposition algorithm for nonlinear elliptic boundary value problems
K. A. Murphy	303	Parameter estimation in moving boundary problems
C. A. M. van Berkel and J. de Graaf	307	On a property of the Fourier–cosine transform
E. L. Wachspress	311	The ADI minimax problem for complex spectra
R. I. Greenberg and C. E. Leiserson	315	Erratum to A Compact Layout for the Three-Dimensional Tree of Meshes
	I	Instructions for authors
	III	Sample pages for authors

NUMBER 4

M. Ahues	317	A note on refining eigenelements of symmetric matrices
D. Atroune	321	Nonlinear observers for continuous fermentation processes
D. F. Bailey and G. J. Fix	327	A generalization of the mean mean value theorem
S.-J. Bang and M. H. Kim	331	Zeros of a function given by the series of functions
G. Behforooz	335	Another approach to the quintic spline
J. Bélair and J. G. Milton	339	Itinerary of a discontinuous map from the continued fraction expansion
K.-W. E. Chu	343	Perturbation theory and derivatives of matrix eigen-systems
J. E. Greer and G. I. McCalla	347	Formalizing granularity for use in recognition
S. M. Kokoska	351	The analysis of cancer chemoprevention experiments in which there is heterogeneous Poisson sampling

E. Krusińska	357 <i>L_p-logistic discrimination</i>
N. C. Maiti and L. Debnath	361 Transient wave motions due to an asymmetric shear stress discontinuity in a layered elastic medium
M. A. Noor	367 Quasi variational inequalities
M. A. Noor and S. I. A. Tirmizi	371 Numerical techniques for a class of unilateral problems
A. G. Ramm	377 Multidimensional inverse problems: uniqueness theorems
A. G. Ramm	381 Numerical method for solving 3D inverse scattering problems
B. B. Sanugi and D. J. Evans	385 A Fourier series method for the numerical solution of the nonlinear advection problem
H. M. Srivastava and S. Handa	391 Some general theorems on generating functions and their applications
P. K. Subramanian	395 A note on least two norm solutions of monotone complementarity problems
S. I. A. Tirmizi	399 A fourth-order accurate method for fourth-order two-point nonlinear boundary value problems
A. A. Ungar	403 The Thomas rotation formalism underlying a non-associative group structure for relativistic velocities
	i Instructions for authors
	iii Sample pages for authors

